

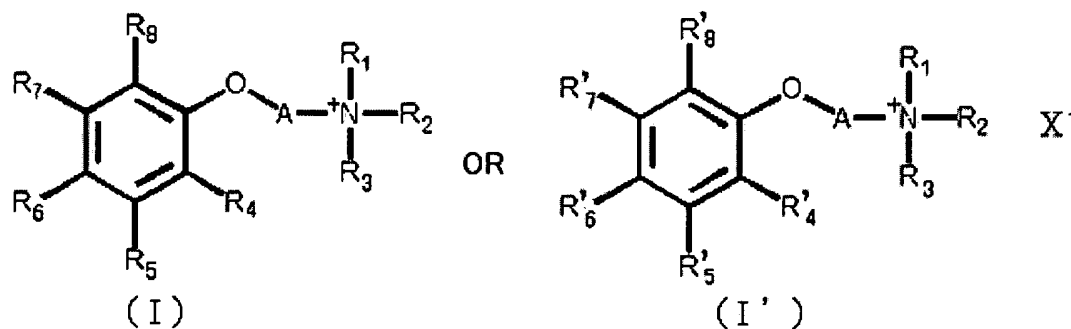
IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim 22 has been added as follows:

Listing of Claims:

Claim 1 (original): A quaternary ammonium compound represented by general formula (I)
or (I'):



(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, R₁ to R₃ may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms, one of R₄ to R₈ represents CO₂⁻ or SO₃⁻, while no more than three of the remaining R₄ to R₈ represent a group selected from the group consisting of a hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, and other R₄ to R₈ represent a hydrogen atom, one of R'₄ to R'₈

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represents CO₂H or SO₃H, no more than three of the remaining R'₄ to R'₈ represent a group selected from a protected hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, while other R'₄ to R'₈ represent a hydrogen atom, and X⁻ represents an anion capable of forming a salt with a quaternary ammonium group).

Claim 2 (original): A quaternary ammonium compound according to claim 1, wherein one of R₄ to R₈ is CO₂⁻, or one of R'₄ to R'₈ is CO₂H.

Claim 3 (original): A quaternary ammonium compound according to claim 1, wherein one of R₄ to R₈ is SO₃⁻, or one of R'₄ to R'₈ is SO₃H.

Claim 4 (original): A quaternary ammonium compound according to claim 2, wherein one of the remaining R₄ to R₈ or one of the remaining R'₄ to R'₈ is a hydroxyl group.

Claim 5 (original): A quaternary ammonium compound according to claim 3, wherein one of the remaining R₄ to R₈ or one of the remaining R'₄ to R'₈ is a hydroxyl group.

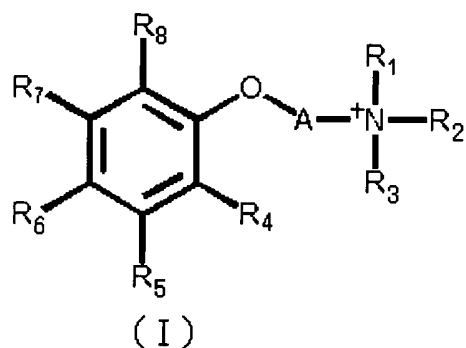
Claim 6 (original): A quaternary ammonium compound according to claim 4, wherein A is a linear alkyl group having 2 carbon atoms.

Claim 7 (original): A quaternary ammonium compound according to claim 5, wherein A is a linear alkyl group having 2 carbon atoms.

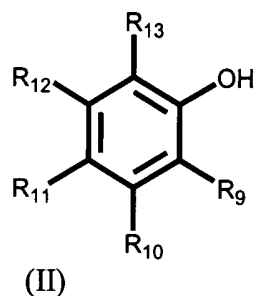
Claim 8 (original): A quaternary ammonium compound according to claim 6, wherein R₁ to R₃ are methyl groups.

Claim 9 (original): A quaternary ammonium compound according to claim 7, wherein R₁ to R₃ are methyl groups.

Claim 10 (original): A process for producing a quaternary ammonium compound represented by general formula (I):



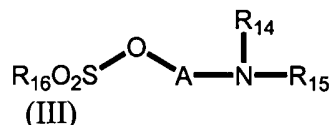
(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, R_1 , R_2 and R_3 may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms, one of R_4 to R_8 represents CO_2^- or SO_3^- , while no more than three of the remaining R_4 to R_8 represent a group selected from the group consisting of a hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, and other R_4 to R_8 represent a hydrogen atom) comprising:
 reacting with a phenol derivative represented by general formula (II):



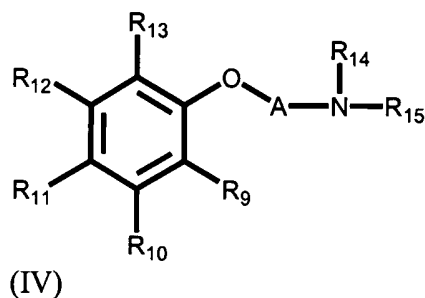
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(wherein, one of R₉ to R₁₃ represents a carboxyl group protected or a sulfonic acid group by an ester group, no more than three of the remaining R₉ to R₁₃ represent a group selected from the group consisting of a protected hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, and other R₉ to R₁₃ represent a hydrogen atom) a sulfonic acid ester derivative represented by general formula (III):



(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, R₁₄ to R₁₅ may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms, and R₁₆ represents a lower alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 7 carbon atoms) in an organic solvent and in the presence of a basic substance, to obtain a an amino compound represented by general formula (IV):



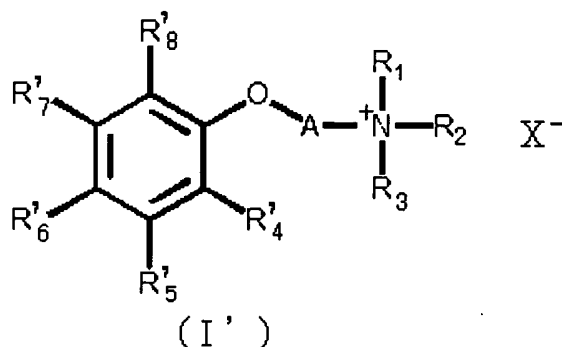
(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, one of R₉ to R₁₃ represents a carboxyl group or a sulfonic acid group protected by an ester group, no more

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than three of the remaining R_9 to R_{13} represent a group selected from the group consisting of a protected hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, other R_9 to R_{13} represent a hydrogen atom, and R_{14} to R_{15} may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms), and a linear or branched alkyl halide having 1 to 12 carbon atoms or a sulfonic acid ester esterified by a linear or branched alkyl group having 1 to 12 carbon atoms is reacted with a compound represented by general formula (IV), followed by de-protecting the carboxyl group or the sulfonic acid group protected by an ester group, and the protected hydroxyl group, and treating with an ion exchange resin.

Claim 11 (original): A process for producing a quaternary ammonium compound represented by general formula (I'):



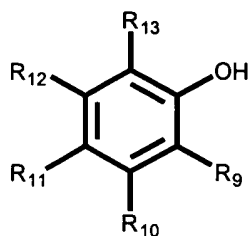
(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, R_1 , R_2 and R_3 may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms, one of R'_4 to R'_8 represents CO_2H or SO_3H , while no more than three of the remaining R'_4 to R'_8 represent a group selected from the group consisting of a hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, other R'_4 to R'_8 represent a hydrogen atom, and

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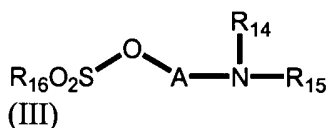
X⁻ represents an anion capable of forming a salt with a quaternary ammonium group)

comprising: reacting with a phenol derivative represented by general formula (II):

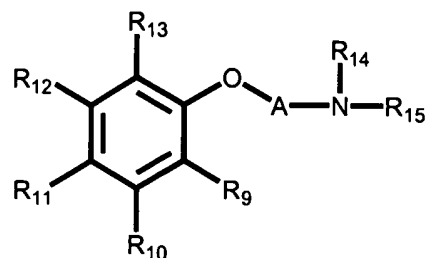


(II)

(wherein, one of R₉ to R₁₃ represents a carboxyl group or a sulfonic acid group protected by an ester group, no more than three of the remaining R₉ to R₁₃ represent a group selected from the group consisting of a protected hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, and other R₉ to R₁₃ represent a hydrogen atom) a sulfonic acid ester derivative represented by general formula (III):



(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, R₁₄ to R₁₅ may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms, and R₁₆ represents a lower alkyl group having 1 to 4 carbon atoms or an aryl group having 6 to 7 carbon atoms) in an organic solvent and in the presence of a basic substance, to obtain a an amino compound represented by general formula (IV):



(IV)

(wherein, A represents a linear alkyl group having 1 to 4 carbon atoms, a branched alkyl group having 2 to 4 carbon atoms, a linear alkyl group having 1 to 4 carbon atoms and a hydroxyl group, or a branched alkyl group having 2 to 4 carbon atoms and a hydroxyl group, one of R₉ to R₁₃ represent a carboxyl group or a sulfonic acid group protected by an ester group, no more than three of the remaining R₉ to R₁₃ represent a group selected from the group consisting of a protected hydroxyl group and an alkoxy group having 1 to 4 carbon atoms, other R₉ to R₁₃ represent a hydrogen atom, and R₁₄ to R₁₅ may be the same or different and represent a linear or branched alkyl group having 1 to 12 carbon atoms), and a linear or branched alkyl halide having 1 to 12 carbon atoms or a sulfonic acid ester esterified by a linear or branched alkyl group having 1 to 12 carbon atoms is reacted with a compound represented by general formula (IV), followed by de-protecting the carboxyl group or the sulfonic acid group protected by an ester group, and the protected hydroxyl group, and treating with an acidic substance.

Claim 12 (original): A process for producing a quaternary ammonium compound represented by general formula (I) or (I') according to claim 10, wherein the organic solvent used in the step for reacting a sulfonic acid ester derivative represented by general formula (III) with a phenol derivative represented by general formula (II) is an alcohol, ether or amide organic solvent.

Claim 13 (original): A process for producing a quaternary ammonium compound represented by general formula (I) or (I') according to claim 12, wherein R₁₆ of general formula (III) is a methyl group.

Claim 14 (original): A process for producing a quaternary ammonium compound represented by general formula (I) or (I') according to claim 13, wherein the organic solvent used in the step for reacting a sulfonic ester derivative represented by general formula (III) with a phenol derivative represented by general formula (II) is an ether organic solvent having 4 to 6 carbon atoms.

Claim 15 (original): A cerebrovascular disease therapeutic agent having for an active ingredient a quaternary ammonium compound according to claim 1.

Claim 16 (original): A cerebrovascular disease therapeutic agent according to claim 15, wherein the cerebrovascular disease is cerebral infarction, cerebral thrombosis, cerebral embolism, transient ischemic attack or a functional disorder caused by these diseases.

Claim 17 (original): A use of a quaternary ammonium compound according to claim 1 for producing a cerebrovascular disease therapeutic agent.

Claim 18 (original): A treatment method for a cerebrovascular disease using a quaternary ammonium compound according to claim 1.

Claim 19 (original): A heart disease therapeutic agent having for an active ingredient thereof a quaternary ammonium compound according to claim 1.

Claim 20 (original): A use of a quaternary ammonium compound according to claim 1 to produce a heart disease therapeutic agent.

Claim 21 (original): A treatment method for a heart disease using a quaternary ammonium compound according to claim 1.

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Claim 22 (new): A process for producing a quaternary ammonium compound represented by general formula (I) or (I') according to claim 11, wherein the organic solvent used in the step for reacting a sulfonic acid ester derivative represented by general formula (III) with a phenol derivative represented by general formula (II) is an alcohol, ether or amide organic solvent.